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SOURCE Ugol', No 8, 1950PROSPECTIVE INCREASE IN USSR OPEN-PIT MINING

A. A. Savchenko

The open-pit method of coal mining is becoming more significant each year in the USSR. Before World War II only 3 percent of the total coal output was mined by this method, but by 1949 the figure had been increased to 12 percent. A still further increase in the open-pit method of coal mining is assured by the fact that many USSR deposits with a high coal content are adapted to this method of working.

At present the Bogoslovskiy, Volchansk, Veselovskiy, Korkino, Raychikhinsk, Karaganda, Cheremkovo, Irsha-Borodino, and Angren coal deposits are being worked by the open-pit method. Soon lignite deposits in the Bashkir SSR and bituminous coal deposits in the Ukrainian SSR and in Krasnoyarsk Kray will be worked by this method.

During World War II enormous coal pits were constructed by the Korkinugol' and the Vakhrushevugol' trusts (Urals) and by the Raychikugol' trust (Khabarovsk). Each of these trusts removes 70,000 to 100,000 cubic meters of coal and rock per day.

During the first years of the postwar Five-Year Plan open-pit mining was radically improved by the introduction of modern, heavy equipment. Light 0.5 to 1.0 cubic meter excavators and steam powered excavators were replaced by electric powered excavators with a bucket capacity of 3 cubic meters or more. Locomotives with a weight on driving wheels of 50-60 tons were replaced by heavy locomotives with a weight on driving wheels of 80-90 tons. Twenty-ton manually operated dumping cars were replaced by 40-50-ton automatically operated cars.

Although the open-pit method of mining is the youngest branch of the USSR coal industry, it is most outstanding and progressive in its level of mechanization and rate of growth.

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Stalin Prizes were awarded to a number of USSR mining engineers who introduced such improvements into open-pit mining that the coal output was tripled during the war and also to a group of machine builders, a professor, and a number of engineers who designed highly productive excavators.

Workers of the Karpinsk Plant of the Main Administration of Coal Machinery and the State Institute for Designing Coal Machinery designed the first heavy walking dragline in the USSR, a terracing plow, rotary drilling machines, and track-moving machines.

Cranes have been utilized in laying railroad tracks and ballast pits have been provided to assure a continuous supply of ballast for the railroads. Many measures have been adopted to step up the speed of trains and to assure their continual operation along the pit benches and banks, particularly in rainy weather.

The nontransport system of removal in the lower benches of coal pits in the Bogoslovskiy deposit made it possible by the dumping of rock into the worked-out area and a subsequent removal of it by excavator or dragline to reduce the cost of removal work to one third to one half of its former figure.

Walking draglines with a 10-cubic-meter bucket capacity with an operational range two to three times as great as existing models, and with a productivity of 3 to 4 million cubic meters per year will lead to more ideal and efficient methods of operations and, in particular, to the expansion of the nontransport method for removal of coal and rock in open-pit mining. Excavators of unique design and power shovels with 15-cubic-meter capacity will also aid methods.

The Raychikhinsk, the Cheremkhovo, and other deposits can be worked entirely by a nontransport method using 10 to 15-cubic-meter power shovels and 10 to 18-cubic-meter draglines with a 50 to 75-meter boom. The nontransport method is distributed over various coal deposits and basins as follows: the Bogoslovskiy deposit (Urals), 50 percent; the Cheremkhovo Basin (East Siberia) 60 percent; and the Raychikhinsk deposit (Khabarovsk), 80 percent. For the Ministry of the Coal Industry as a whole the nontransport method will be used 5.3 times as much in 1955 as at present, accounting for 30 percent of the total removal of rock and coal in open-pit mining.

At the suggestion of a number of workers in repair shops of the Korkinugol' and Vakhrushevugol' trusts the rig of the SE-3 excavator was lengthened thus improving the performance of the machine. The volume of work carried on with this type of excavator will be 2.5 times as great in 1955 as in 1950.

Electric traction is replacing steam traction in coal pits of the Bogoslovskiy and Korkino deposits. Even in the first year of this change certain advantages were apparent. Work could be carried on at any season of the year, under any climatic conditions. This was particularly important for eastern areas where during severe frosts excavators were idle 40 percent of the time because of poor functioning of the steam traction.

Railroad transport in connection with open-pit mining has been greatly revised. The locomotives used in pits of the Korkinugol', Vakhrushugol', and Volchanskugol' trusts all had a weight on driving wheels of more than 80 tons. In 1955, electric transport will be used for 66 percent of the total amount of coal and rock removed by the transport method in open-pit mining. This includes 34 percent of the coal thus removed.

Motor transport must be used extensively in moving the rock overburden and the coal. Series production of 24 to 50-ton motor dump trucks and semi-truck trailers is under way.

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Mechanization of labor-consuming processes such as clearing out the roof of coal seams and moving and laying railroad tracks on coal pit benches and banks must be 100 percent mechanized during the next 3 to 4 years.

Introduction of outstanding methods into open-pit mining has resulted in increasing the labor productivity per worker from 65 tons per month in 1941 to 90 tons per month in 1949. Certain enterprises achieved an average monthly productivity of 106 tons per worker in 1949 and 140 tons during the first half of 1950. Some pits using the nontransport method will raise this figure to 200 to 250 tons in 1951.

These are the tasks which face all workers engaged in open-pit mining during 1950-1951:

1. Maximum utilization of the nontransport method of coal and rock removal in pits of the Sverdlovskugol', Khabarovskugol', and Sakhalinugol' combines, raising it to a level of 20 percent in Vakhrushevugol' Trust, 50 percent in Raychikhugol' Trust, and 70 percent in Sakhalin.
2. Electrification of removal by railroad transport in pits of the Vakhrushevugol' and Korkinugol' trusts.
3. Utilization of superheavy 15-cubic-meter shovels and 10-cubic-meter draglines.
4. Full replacement of low-powered excavators by high-powered ones with a bucket capacity of 2 to 3 cubic meters.
5. Introduction of remote control for belt conveyers in pits of the Ministry of the Coal Industry.
6. Introduction in pits of the Korkinugol' and Vakhrushevugol' trusts of a centralization of switch and signal controls and automatic blocking for controlling the movement of trains.

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